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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER LAMPRECHT, JOEL				
ART UNIT		PAPER NUMBER		
3737				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/721,827

Applicant(s)

MACMAHON ET AL.

Examiner

JOEL M. LAMPRECHT

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-19 and 21-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-19, 21-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-11, 13-19, and 21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims do not provide a sufficient tie to another statutory class such as an apparatus, and therefore cannot be considered as a proper process. With regard to the placement of instructions on a computer readable medium; placing a non-statutory method on a computer readable medium does not render the claim statutory.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 6-9, 11, 13-17, 19, 21, 22, 27-30, 32-36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al (US 5,931,780) in view of Jabri et al (US 6,661,873 B2) and in further view of Avinash et al (US 2004/0252873 A1).

Giger et al disclose the acquisition of images (Col 3 Line 65-Col 4 Line 20) for pathological diagnosis (See figures 5-20 for indications of pathologically significant motivations in Giger et al) including obtaining subtraction images from two images (Fig 21, Col 7 Line 35-67) which include dual-energy images (soft and bone images (Col 7 Line 25-67), extracting features used to help with a computer-assisted diagnosis of abnormal pathology (Col 10 Line 30-40) and being able to superimpose computer symbols indicating results on the image display (Col 10 Line 40-46, Fig 28).

Giger et al do not disclose the use of multiple images at different times specifically, rather only noting that multiple images can be acquired, nor do they disclose the acquisition of shift vectors for acquiring the subtracted image. Attention is directed to the secondary reference by Jabri et al which discloses the use of images taken at two different times which allows for pathological diagnosis (Col 1 Line 15-50 for motivations for diagnosis in Jabri et al) to be made (Col 2 Line 28-42 and Claim 1). Additionally, Jabri et al discloses the use of shift vectors in the production of a decomposed dual-energy image (separated bone/soft tissue image) (Col 7 Line 49-Col 9 Line 36, Figure 8). Regarding the "means for" claims, although the structures

disclosed in Giger et al and Jabri et al are not identical to those of the instant application, they provide the same functionality in combination and are deemed to meet the means for requirement. It would have been obvious to one of ordinary skill in the art at the time of the invention to have included the image acquisitions of Jabri et al with the dual-energy subtraction image diagnosis of Giger et al, as Jabri et al also uses a dual energy image acquisition and Giger et al would benefit from allowing for tracking of diagnostic parameters over some period of time.

Giger et al in view of Jabri et al discloses all that is listed above, but fails to include the method of obtaining temporal subtractions during a time period "long enough to allow for pathological change", though one could technically argue that motion variations and diffusion changes within a lesion would be on the order of 100-200ms and could be significant to one of ordinary skill in the art. This specific and short period of time, in the view of Examiner, does not allow for a variation on the order which is disclosed by Applicant's specification and so attention is directed to the teaching reference by Avinash et al in the same area of endeavor which discloses a method for acquiring multiple images separated by a time period long enough to allow for temporal variations in a region (0003-0010, 0023-0031) and acquiring shift vectors from a standard image at multiple times to enable registration of a dual-energy or multi-energy image across various energies (0024-0028, 0034, 0047-0057) in order to allow for display of diagnostic information about the pathological state of a patient (0036-0039). It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the methods of Avinash et al with those of Giger et al in view of Jabri et

al for the purpose of incorporating analysis of true temporal changes within or over a time period of a patient (0012-0015), and allowing for flexible registration of various energy images acquired from imaging data at the various times (0053-0056).

Claims 2-5, 10, 18, 21, 23-26, 31, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Giger et al in view of Jabri et al and Avinash et al as applied to claims 1, 9, 16, 22, 30, and 35 above, and further in view of Armato et al (US 6,282,307 B1). Giger et al and Jabri et al in view of Avinash et al disclose all that is listed above including identification of pathological differences and artifacts with an algorithm (Jabri et al Claim 17). Giger et al in view of Jabri et al do not disclose the use of gray-level histogram analysis for binary image construction, organ masking (smoothing functions), and identification of ON and OFF pixels based on thresholding. Attention is then directed to Armato et al in the same area of endeavor which discloses the use of gray-level histogram analysis of images to construct binary images at different ranges of gray-levels (Fig 1, Col 5 Line 65- Col 6 Line 35) to extract information regarding the lungs from images. This iterative process, uses an unsharp masking technique to identify and smooth (Col 2 Line 35-40, Col 5 Line 65-Col 6 Line 35) the selected lung region. The thresholds chosen based on the histogram are used to identify ON and OFF pixels to assist in identification (Col 6 Line 5-28). It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the methods of Armato et al with the teachings of Giger et al in view of Jabri and Avinash et al for the purpose of providing the most accurate image analysis and diagnosis of contrast images.

Response to Arguments

Applicant's arguments with respect to claims 1-11, 13-19, and 21-38 have been considered but are moot in view of the new ground(s) of rejection. The elements of claims 1, 14, 22 and 33 should now be correctly rejected with the addition of the Avinash et al reference.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel M. Lamprecht whose telephone number is (571) 272-3250. The examiner can normally be reached on Monday-Friday 7:30AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JML

/Ruth S. Smith/
Primary Examiner, Art Unit 3737